WEXFORD HARBOUR.

RETURN to an Order of the Honourable The House of Commons, dated 6 June 1856;—*for*,

A COPY "(with Plans annexed) of the REPORT of Captain *Vetch* to Admiral *Beaufort*, on the IMPROVEMENT of the HARBOUR of *Wexford*, dated the 13th day of January 1855."

Admiralty, 18 June 1856.	JOHN JONES DYER, Chief Clerk.

COPY (with Plans annexed) of the REPORT of Captain *Vetch* to Admiral *Beaufort*, on the IMPROVEMENT of the HARBOUR of *Wexford*.

Sir, Harbour Branch, Admiralty, 13 January 1855.

I HAVE to acknowledge the receipt of your letter of the 1st December ult., on the part of the Admiralty Commissioners for improving Wexford Harbour, in which you requested me carefully to examine the plans and estimates prepared by Mr. Farrell, C.E., and that I should report to you in writing my deliberate opinion as to the best plan to be adopted, under all the circumstances of the case, for the guidance of the Commissioners.

Before entering closely into the questions, I thought it desirable to obtain further information on some points from Mr. Farrell, which came duly to hand; and I have now the honour to enclose herewith my Report, accompanied by Plans and Sections. That I have been able to arrive at results satisfactory to myself, I am, in a considerable degree, indebted to my local investigations of these questions at former times, when I took great interest in the matter; and it is some satisfaction for me to find that the lines of embankment which have been carried out have been executed in the north bight of the harbour precisely from the lines I pointed out, and on the south side with no material difference.

I have, &c.
(signed) *James Vetch*, Capt., R.E.

Rr.-Adml. Sir Fras. Beaufort, K.C.B., F.R.S.,
&c. &c. &c., Admiralty.

WEXFORD HARBOUR IMPROVEMENTS.

THE site of Wexford Harbour is important and valuable for commerce in several particulars:

1. As lying immediately within the southern entrance to the Irish Sea, and being there sheltered from the ocean swell by the headlands of Carnsore and Greenore.

2. As being the Irish port nearest to Wales, Milford Haven, and the British Channel, as regards the home trade.

3. As regards the foreign trade, permitting vessels to clear at once to the open sea. And,

Lastly. As being the only port between Dublin and Waterford, and therefore well calculated to become a considerable entrepôt for exports and imports to a large district of country, if the port be rendered easy of entrance

entrance, and of navigation inside, which unfortunately is not the case at present. In several respects, nature has contributed valuable means towards the constituting of a good harbour; and if in other particulars natural difficulties occur, they are such as I conceive may be completely overcome by skill, and a comparatively moderate amount of outlay.

I now proceed to take a general view of the navigation from the Bar to Enniscorthy, up to which town the tides flow, being a total distance of about 22 miles.

The range of tides near Wexford Harbour is unfortunately small in amount, the rise and fall being at

The Tuskar Rock, off Carnsore Point,	8 feet spring,	6 feet neap.
Wexford Bar - - - - -	6 ,,	4 ,,
Wexford Quays - - - -	4 ,,	2 ,,
Enniscorthy - - - -	2 ,,	1 ,,

This defective range of tides inside the harbour may be ascribed, in a great measure, to the great internal expanse of shoal ground over which the tide has to spread itself after passing Rosslare Point, so that in fact the period of flood is insufficient to fill the internal area, and to raise the tides at Wexford Quays to the height at the bar, or at Rosslare Point.

When I visited the harbour in 1841, I found the main or outer harbour to contain 11,858 acres of surface at time of high water, spring tides, and at time of low water only 2,381 acres; and I recommended that, of the shoal ground at the north end of the expanse, 2,192 acres should be cut off from the tides, and, at the south end, 3,341 acres. In 1846 an Act was obtained to enable a company to effect these and other objects, and I now find that 2,360 acres have been reclaimed from the north end, and 2,090 from the south end of the harbour, and that the tides now rise six inches more at Wexford Quays than formerly, and perhaps a further embankment of the south wing of the harbour would augment the benefit. It is not, however, by the mere diminution of the interior area of the main harbour that the range of tides there and onwards can be increased to its full extent. The rise and fall at the bar on spring tides are said to be six feet; and that amount, or more, has to be attained at Wexford Bridge, ere the tidal economy of the harbour can be deemed satisfactory. At present the rise inside the bar is due to the mere pouring in of the water of the flood tide over a barrier of sand three nautical miles in extent, and encircling the deep channel leading direct to sea.

The depth of water on this barrier, at time of low water, is, in a few seven feet, and ranges from that to only one foot, places, other portions of the barrier are only covered at half flood, while inside the barrier, in the channel above mentioned, the depth of water ranges from 14 to 50 feet at time of low water. But up this deep channel the propagation of the tidal waves is intercepted by the bar (or that portion of the barrier sand lying between the deep water inside and the deep water outside); and until this intercepting obstacle be removed to a requisite extent, the range of tide inside, and the momentum and useful scouring power of the tidal wave, must remain undeveloped.

If, therefore, Wexford Harbour be deemed of that importance, and of that capability for improvement which I conceive it possesses, all that skill and art can do to remedy these natural disadvantages must be applied to render it a first-class harbour.

Having pointed out what appears to be the great natural defect at Wexford Harbour, as affecting the whole of its navigation, I proceed to describe the details, which may best be effected by considering the subject in the following sections:

1. From the 18-feet line of soundings outside the bar, and up the main channel to Rosslare Point.
2. The outer or main harbour, from Rosslare Point to Wexford Bridge.
3. The inner harbour, from Wexford Bridge to Carrig Bridge.
4. The River Slaney, from Carrig Bridge to Enniscorthy Bridge.

Each of the above divisions has some character peculiar to itself, and requiring a separate description and treatment.

DIVISION

DIVISION No. 1.

This section is conceived to extend from the line of 18 feet soundings, outside the eastern portion of the bar, across the bar, and comprising the main channel to Rosslare Point (or what may be considered the entrance to the main harbour), the entire distance being 3,200 yards.

The summit or crest of the eastern bar has only five feet of water upon it at low water of spring tides, but it is within 250 yards of the line of 18 feet soundings outside, and therefore ready to yield to a condensed and well-directed force of ebb stream.

At 400 yards inside this eastern bar, the main channel has a depth of 14 feet. and thence to Rosslare Point there is a noble channel, nearly straight, 2,700 yards long, from 14 to 50 feet deep, and with an average width of 500 yards between the six feet lines of water, and as an outlet to the navigation this channel leads directly towards deep water. So far good; but it is flanked, both north and south, by sand banks, and with a bar between it and the deep sea on the east, as has been already stated.

In order to apply a safe remedy for the removal of this great obstacle to the navigation, it is necessary to consider the actual condition of the evil, and to endeavour to trace its origin and history.

If we cast our eye over Captain Frazer's chart of Wexford Harbour and Bay, we shall see that, from four miles southward, and up to Rosslare Point, the line of shore preserves an even and slightly curved course. The foreshore, consisting of sand, and the shore itself of blowing sand hills, both easily acted upon by winds and waves, exhibit the forms and structures which natural influences have produced in the course of ages.

When the winds blow strongly from the southward, the sand, drifted to northward by wind and wave, is deposited in the mouth of Wexford Harbour, whence the outward current again carries it seaward, or to increase the mass of sand called the Dogger Bank, parts of which are dry at time of low water. Across this bank a swash-way has been formed near the shore at Rosslare Point, with a depth of seven feet below low-water mark, called the Hantoon Channel.

On the north side of the entrance, the shore and foreshore, interposed between Wexford Harbour and the sea, are composed of the same materials, and apparently with a similar effect. But the north wind, and not the south, is here the agent, and here the sand-hills appear to have increased in height, and to have extended more seaward, causing a protuberance of the land* in that direction, terminating at Raven's Point, which projects seaward 900 yards beyond the supposed ancient run of the shore; whereas the sand carried seaward from Rosslare Point appears to accumulate in one large mass† on the south side of the channel. The sand carried to sea on the north side appears to trail off from Raven's Point, and to be carried first eastwards and then southwards, and lastly, overlapping the Dogger Bank, but leaving between them a channel seven feet deep, and much broader than the Hantoon Channel.

* *See* Plan No. 1.

† Dogger's Bank.

If we assume the bed of the sea outside of the barrier bank, and the bed of the channel inside, to have each a medium depth of 18 feet below low water of spring tides (as is fully the case), then the barrier bank constitutes a circular ridge of sand about 5,800 yards in length, and about 14 feet high, over which the tide ebbs and flows from and to Wexford Harbour, and over this barrier, at time of half flood, the sectional area of waterway amounts to 12,058 square yards; whereas the cross sections of the channel at Rosslare Point and Raven's Point only show at the same time waterways of 3,584 square yards and 4,000 square yards respectively; we must therefore infer that the waterway over the bar is three times too great, and consequently the velocity of stream three times less than it should be to make and maintain a deep channel across the barrier; and pointing out the necessity of contracting the width of the waterway across the barrier bank, and of confining it to a direction in prolongation of the deep channel inside the barrier sand.

Such being the state of the question, as far as my investigation goes, we have to consider the remedy which will be both effectual and permanent.

Hitherto nature has had it all her own way; she is quite mistress of her material, sand, and has raised her barrier into that shape which the balance of her

her forces has established. Several of these forces tend to raise up the banks, and others to beat them down again; but if, by mere mechanical force, we were to help nature to raise up the sand banks higher, and to scoop out the swashways deeper, and were then to leave so transportable a material to natural action, the consequence would be, that in a short space of time the barrier would return to its previous state.

Suppose the Hantoon, for instance, or any other of the lateral swashways, was deepened by a dredging machine from 7 to 11 feet, it would, in all probability, silt up again very shortly. But even were such a deepening to prove more permanent, it would but increase the difficulty of ever obtaining a direct entrance to sea, worthy of the port and position of Wexford.

I would therefore recommend the converse proceeding, observe where the constructive power of nature is building up her banks on either side of the channel, and then cap her buildings with a material which her destructive powers would be unable to remove, as proposed at the mouth of the Tyne.

No. 3. On an accompanying drawing is shown the crest line of the barrier of sand, and adjoining to that line on Plan No. 1 are shown the lines where I propose to assist the constructive power of nature with hard material, and thereby maintain the same against her destructive action. These works may be formed of common rubble stone, and being in shoal water the cost would not be great, although beyond the present means of the Harbour Commissioners.

Different to my views of treatment, I perceive Mr. Farrell has proposed to improve the outlet to sea by the expedient of deepening the Hantoon channel from 7 to 11 feet below low-water mark, that being the channel chiefly used, as being more sheltered, although there are six other such channels or swashways equally deep. But the enlargement of any of these, were it practicable to maintain them, I conceive would render it more difficult than ever to obtain one good, sufficient, and direct access to sea.

Mr. Farrell calculates the amount of dredging the Hantoon channel required at 109,328 cube yards, and the cost of the same at 4 *d.* per ton, or 6 *d.* per cube yard; I find the quantity of stuff to be removed correct, but I doubt if any substantial contractor would offer to do it for less than 9 *d.* per cube yard, and therefore I think Mr. Farrell's estimate should be raised from 2,733 *l.* 4 *s.* to 4,099 *l.* 16 *s.* But if such work be executed amongst sheer sand, what guarantee is there that the cutting will not be filled up again shortly? And with such small funds it is necessary that no money be spent except on works which will be sure and permanent, and under all circumstances I consider it will be prudent to defer this part of the proposed works.

My opinion is, that the funds should not be expended until they have all been collected, and before going any further it may be as well, before building our castle, to consider what are the sums at disposal; 5,000*l.* has been received and 5,000*l.* more is about due; there then remains 10,000*l.* to be paid by annual instalments, in ten years. I assume it will be two years before this will be required, but when it is, money may be obtained on its security, nearly to the amount. I therefore assume that there is now, or shortly will be, a disposable fund to the amount of 20,000*l.* for the improvement of Wexford Harbour, and I find the revenue of the harbour amounts to about 2,520 *l.* per annum; so that, after paying annual expenses, to what purpose can the residue be so well applied as to assist in the improvement of the harbour, the increase of its revenue, and the wealth of the city?

Some dozen years ago it was alleged that the Wexford merchants were desirous that the access to the harbour should be so bad, that no vessels but their own small craft could carry on the traffic; but it is to be hoped that their views have now become enlarged, and that it may now be expected that the harbour trust may contribute 1,000*l.* a year of their income towards the works for the improvement of the harbour, and on which a loan for 10,000*l.* might be effected, so as to raise the available funds to 30,000 *l.*

From the report of the Tidal Harbour Commissioners of 1846, it appears that the governing Act of the harbour was obtained in 1843; that 51 Commissioners are named in the statute; that the actual number was 104; and that since 1794, 50,000*l.* had been raised by dues on shipping, &c., which had been expended chiefly in building the quays of the town, erecting perches, and placing a few buoys, while little had been done for improving the channels.

The present revenue of the harbour is about 2,500*l.* per annum, which, in consequence

consequence of the improvements going on in the harbour and town, may eventually be doubled; and if the navigation was deepened to 15 feet from the sea to Wexford Quays, it would in all probability be raised to a high figure, the commerce of the town and district would be much augmented, and the value of property greatly increased. But with such a numerous body of Commissioners, and so constituted, no great good can be expected to arise.

One of the greatest improvements to the harbour would therefore consist in obtaining an amended Act, reducing the number of Commissioners to 12 at the most, and requiring that they should be elected by the suffrage of the inhabitants of Wexford and the vicinity, holding a moderate qualification. That done, a legitimate, useful, and increased revenue might become applicable for the improvement of the navigation. I allude to this, though apparently out of place, because the great desideratum is a sufficiency of funds, and from no other quarter can they so legitimately be obtained.

It is not to be disguised that though the portion of the navigation now under notice be the most important, it is at the same time the most difficult and costly to deal with, and as the want of funds must retard its accomplishment, time will be given for further information, consideration, and estimates; and I would now merely venture to lay down the principle, that outside of Rosslare Point all the dredging and deepening must be effected by natural means, and that the works outside the point consist of solid structures to confine the channels within proper limits, and in the right direction, while within Rosslare Point the best course of proceedings would consist of excavations by steam power.

DIVISION No. 2.

We have now to consider that part of the harbour extending from Rosslare Point to Wexford Bridge, which measures, in a straight line, 6,600 yards, nearly 3 ½ nautical miles, while the breadth may at present be taken at three nautical miles. The high-water surface is equal to 7,408 acres, and the low-water surface to 2,381, leaving dry at low water 5,127 acres, a sad drawback to its tidal capacity; but though the bed of the harbour can be only partially and slightly deepened, the effect of gaining one foot additional height of tide inside the harbour would be very great.

While by the straight line the distance from Rosslare Point to Wexford Bridge is 6,600 yards, along the line of sailing channel the distance is increased to 8,400 yards. By the present sailing channel immediately inside Rosslare Point, and for a distance of 700 yards, the depth is 15 feet and upwards. On the Gul Bar there is but five feet water, but immediately above it there is again a narrow channel about 870 yards long, having 13 feet water; and lastly from the dock to Wexford Bridge there is a distance of 1,200 yards, with 13 feet water and upwards; while the remainder of the channel, 5,430 feet in length, may average a little over eight feet.

Mr. Farrell proposes to give the whole of this channel a depth of not less than 11 feet by dredging; but what is called the channel hardly deserves the name; since, excepting the 1,200 yards from the dock to Wexford Bridge, the rest is but a deeper portion of a great shoal; it is tortuous, as said before; is without distinct outline or landboard, and is difficult to navigate, especially in thick and blowing weather; so that, if deepened on Mr. Farrell's line, it would still remain a very incommodious navigation.

Mr. Farrell estimates its improvement as follows: 4,872 yards in length, by 103 wide, and 1 ¼ deep, to give a depth of 11 feet; in all 553,605 cube yards, at 6 *d.* per yard, 13,840 *l.* 2 *s.* 6 *d.* Considering the great length of narrow cut, and its exposure and distance to discharge the material dredged up, I do not expect that any substantial contractor would undertake it for less than 9 *d.*; this would raise the cost to 20,760 *l.* 3 *s.* 9 *d.* I doubt, however, much, whether such a narrow and tortuous channel could or would be successfully executed; and if executed whether such a channel, cut in a tortuous line through a great flat shoal, without a landboard on either side, would be worth the trouble and expense.

Mr. Farrell, according to his statement, would prefer, if sufficient funds could be procured, to adopt the alternative of using the Coal Channel, which, proceeding from the main channel at Rosslare Point, takes a more direct course to Wexford, for a distance of two miles, and with a depth of water of not less than 15 feet, reaching in places to 30 feet, and requiring little excavation to give a uniform depth of 18 feet.

As just stated, Mr. Farrell prefers this line of channel to the improvement of the old channel, but recommends the old one as being less costly; but in my opinion, the line of Coal Channel is so vastly superior in many respects to the existing line, that a mere question of a few thousand pounds ought to prove no obstacle.

Mr. Farrell's scheme for connecting the Coal Channel with the old one, at a point 1,200 yards east of the slip dock, consists of two curves, which, I think, is a faulty arrangement; and I would submit that, though somewhat more costly, there be but one curve from Rosslare Point to Wexford Bridge, the concave shore holding to the south side all the way, and blending with the quays of Wexford

I have pointed out my objection to the scheme of improving the old channel, and have now to point out the advantage of the cut which I recommend; first, if dredged to 18 feet, a navigation of that depth may be obtained from Wexford Bridge to the bar; whereas the north channel could not be increased beyond 11 feet in depth; secondly, because it would be easy of navigation, which the other would not. It is also to be observed that on the line of channel which I recommend, there is now a continuous navigation from the bar at sea, to that point in the Coal Channel (from whence I propose to effect the cut), of 3½ miles of 18 feet water, and that from my point of upper juncture with the old channel to Wexford Bridge, a distance of 1,600 yards, the same depth would be easily procurable, while from Wexford Bridge to Carrig Bridge the existing depth extends from 15 to 18 feet. My proposed new cut, 1¼ mile in length, is all that is required to give a deep navigation from the bar to Carrig Bridge, and carrying 18 feet water to Wexford Bridge.

It may be asked, What is the advantage of a deep navigation inside, if the deepest channel across the barrier of sand be now only seven feet? To this I reply, that a deep interior channel of 8¼ nautical miles in length, would be one of the most powerful means towards the removal of the bar, and of carrying that depth to sea, as the speed and force of the tidal wave would be in proportion to its depth.

Assuming, as has been done, that the dredging of the old channel would cost 9 *d.* per cube yard, in the new cut it ought not to cost more than 6 *d*, from the compact and straight line of work, from its being sheltered, and from having a place of deposit near at hand, in the disused part of the old Coal Channel; the first would prove troublesome to dredge, while the latter would be easy. In the old channel the whole depth of 11 feet must be dredged out at once, while in the new cut, a depth of eight or nine feet might at first suffice to see how far nature might effect the remainder, but in either case such a depth would be the first step in the operation.

Excavating the new cut to 11 feet, would amount to 1,084,160 cube yards, which at 6 *d.* per cube yard amounts to 27,104 *l.*, and to this great work I would recommend that the funds at command be entirely applied, and not scattered on other works of doubtful effect. The cut should commence from the end abutting on the Coal Channel, and it would be sufficient, for the first slice, to take the bed down to eight feet below low-water mark; this, at 6 *d.* per cube yard, would cost 20,656 *l*, and would improve the present navigation by at least two feet, and pave the way for nature to increase the depth.

As auxiliary improvements, I would recommend that the reclamation company be induced to extend their embankment to lines parallel to the lines of the proposed new cut, which would greatly assist the current through the cut. I would also recommend that the Ballast Bank and Wexford Old Bridge should be removed, as every hour they are allowed to remain is so much useful scour wasted.

As regards the navigation of the River Slaney, I have on a former occasion seen and approved of Mr. Farrell's plan of improvement, estimated at 14,000 *l.*, and to raise which sum an Act was obtained in 1852; but as yet it does not appear

appear that any work of deepening has been effected. £. 14,000 ought, in such a position, to excavate 560,000 cubic yards from the bed of the river, and greatly improve the action of the tides and land water; but like the removal of the Ballast Bank and Wexford Bridge, every day delayed in the execution of it is so much scouring power thrown away. I attach great importance to these auxiliary works towards effecting a deep channel, by which the activity and rise of the tides might be much augmented.

Since writing the above, I have referred to a map of the harbour, drawn at the beginning of this century, and perceive that the entrance across the bar was then 16 feet deep, and was marked by three buoys in a straight line,* and nearly in the direction which I have presumed it might be restored to, through the assistance of the proposed outer works. On my inquiry in 1841, it was mentioned that a frigate had entered the harbour at the end of the last century, and the particulars recited, left no doubt as to the fact; and Sir John Rennie, in his Report of 1831, states that, in 1808, there were 14 feet of water on the east bar at spring tides, and that it continued of easy access for many years.

(signed) *James Vetch*,
Captain, R. E.

Harbour Branch, 13 January 1855.

EXPLANATION of the PLANS and SECTIONS accompanying Captain *Vetch's* Report on *Wexford* Harbour.

DRAWING, No. 1.

COPY of Captain *Frazer's* Chart, or General Plan of the Harbour, from Carrig Bridge to the Sea, showing the proposed Improvements.

THE space coloured yellow shows the existing channel of navigation, as proposed to be improved by Mr. Farrell.

The space coloured red shows the channels which I conceive, under the conditions of the problem, the best adapted to procure a deep, accessible, and permanent navigation from deep water at sea to Wexford Bridge and upwards, by means of a cut connecting the Coal Channel with the old channel above the Gut Bar; and it will be perceived that this line of channel, from Rosslare Point to the quays at Wexford, would present a continuous harbour over its whole extent, and with the line of embankment brought out parallel to it, would permit quays or landing stages being erected anywhere on that distance of 3½ miles; and were a road or railway carried along the line of embankment, a direct communication would be formed between the town and Rosslare Point, and any vessel at the landing stages so constructed. The embankment parallel to the channel, would also prove a good landboard, and sure sailing guide at all times and in all weathers. None of these advantages could be obtained in the old line of channel, as proposed to be improved.

On this drawing is shown (outside of Rosslare Point) the line of the crest of the barrier bank which surrounds the deep channel to sea, and along the north and south flanks of that barrier ridge, I have traced out lines of guide walls or breakwaters to confine the stream of ebb and flood tides within the deep line of present channel and former navigation, and to cut off all lateral swashways, and prevent drift and other sand passing into or across the natural line of channel, and thereby to restore the deep entrance which existed at the beginning of the century.

These latter works may occupy much time to complete; but every step in the work will prove useful, and with patience and perseverance, the great object would be obtained. The greater portion of these guide walls or breakwaters lie in very shallow water, and so far would not cost much; and as they are drawn on an axis of accumulation, as pointed out by the soundings, natural action would probably heap up sand and loose materials to strengthen the work of art.

The most pressing portion of this work I conceive to be the north shore, at the entrance opposite to Rosslare Point, viz., from the low-water mark at Raven's Point on the sea-shore, to low-water mark on the harbour shore,† and this portion, being connected with the land on the north side, would not be expensive, but requires being fixed in the best direction.

Three buoys in one line,‡ and marked green, show what was the sailing course over the east bar with 16 feet water, as obtained from a map of Wexford Harbour, as published in 1811 on the county map.

* Plan, No. 1.

† *See* line *S. D.* on Plan, No. 1.

‡ *R. R.* Plan, No. 1

Drawing, No. 2.

This drawing exhibits, 1st The section of the present channel from Wexford Bridge to Rosslare Point, and thence through the Hantoon Channel to 22 feet water in the South Bay, and the yellow line of 11 feet water shows the extent to which Mr. Farrell proposes to deepen that line of navigation, and to effect which it will be seen that dredging must be carried over a great length of channel, viz., 7,000 yards; but beyond 11 feet, deepening would be no farther practical from the great quantity of stuff which would be required to be removed, as the lines drawn at the respective depths of 14 and 18 feet will readily show.

2dly. A section of the present line of channel from Wexford Bridge, for a distance of 1,600 yards; then of a straight cut, 2,500 yards, to the Coal Channel, thence along the Coal Channel to Rosslare Point, and thence to sea by the old and deep channel, in a direction E. by S. to deep water at sea; and it will be seen, that though on the 11 feet line (also shown in this section), the amount of dredging would be greater than by the first section, yet that on the 14 and 18 feet lines a great depth would be easily obtained at a very little expense; indeed as already existing, excepting always on the length of the new cut.

The cross section A. B. shows the Hantoon channel as now existing, with a space coloured yellow, to which Mr. Farrell proposes to deepen it. The cross section C. D. shows the main channel to sea, as now existing, about half way between Rosslare point and the bar; and these two cross sections are placed in juxta-position for the purpose of comparison.

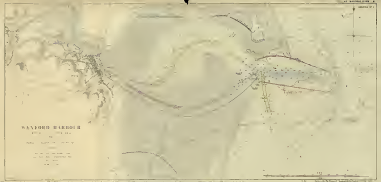
Drawing, No. 3.

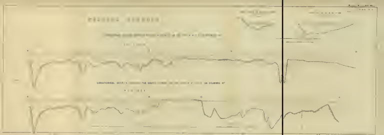
This is a copy of that part of the original survey of Captain Frazer's (of 1843), which extends seaward of Rosslare Point, embracing the deep and broad seaward channel of the navigation, 1½ mile in length, and embracing also the sandbanks which encompass that channel on three sides.

On this drawing the water of 12 feet depth and upwards, both inside the barrier sands and outside, are tinted blue, to show the extent of the same and the intervening shoal grounds, and on these last contour lines are drawn and coloured, to show the configuration of the banks at low water, and at two, four, six, and eight feet below it, with a view to point out the positions or sites where the greatest and least tendencies to deposit exist, and a dotted line marks, the ridge or crest line of the encircling barrier bank from Rosslare Point to Raven's Point, nearly three miles in length, and across which the tide ebbs and flows. The sectional area of which waterway, at time of low water, is about three times greater than the sectional area of the navigation at Rosslare Point and Raven's Point, cross sections of which are also shown on the drawing, and point out the importance of confining the present waterway over the barrier bank to about one-third of its present sectional area, and of stopping up all the lateral swashways by breakwaters to the extent coloured red on the section, with the object of directing the energies of the tide in the prolongation of the deep channel direct to sea, and thereby restoring a navigable depth over the east bar equal to what it was in 1810, when there was 16 feet water; and at an earlier period, when a frigate was able to enter the harbour, the sailing course of which deep entrance over the bar is shown on Drawing, No. 1.

(signed) *James Vetch.*

Harbour Branch, 13 January 1855.


WEXFORD HARBOUR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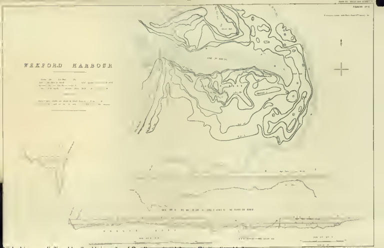
WEXFORD HARBOUR



WEXFORD HARBOUR.

COPY (with Plans annexed) of the REPORT of Captain *Vetch* to Admiral *Beaufort*, on the IMPROVEMENT of the HARBOUR of *Wexford*, dated the 13th day of January 1855.

(*Mr. George.*)

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